



EMCON

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Date May 25, 1995
Project 0805-130.03

To:

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502-6577

We are enclosing:

Copies	Description
<u>1</u>	<u>First quarter 1995 groundwater monitoring report</u>
	<u>for ARCO service station 2185, Oakland, California</u>

For your:	<u> X </u>	Use	Sent by:	<u> </u>	Regular Mail
	<u> </u>	Approval		<u> </u>	Standard Air
	<u> </u>	Review		<u> </u>	Courier
	<u> </u>	Information		<u> X </u>	Other <u>Certified</u> <u>Mail</u>

Comments:

The enclosed groundwater monitoring report is being sent to you per the request of ARCO Products Company. Please call if you have questions or comments.


David Larsen
Project Coordinator

cc: Kevin Graves, RWQCB - SFBR
Michael Whelan, ARCO Products Company
David Larsen, EMCON
File

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May 17, 1995
Project 0805-130.03

Mr. Michael Whelan
ARCO Products Company
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Re: First quarter 1995 groundwater monitoring program results, ARCO service station 2185, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the first quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 2185, 9800 East 14th Street, Oakland, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

Between May and October 1991, ROUX performed a preliminary subsurface environmental assessment to evaluate the presence of gasoline hydrocarbons in soil near the existing underground storage tanks (USTs) before tank removal. As part of the investigation, ROUX (1) installed two soil-vapor extraction (SVE) wells (VW-1 and VW-2) and performed a vapor extraction pilot test in June 1991, to evaluate the feasibility of SVE at the site, and (2) drilled four soil borings in the vicinity of the proposed new UST pit to evaluate preexisting hydrocarbon impact to soils in the area. In October 1991, ROUX observed the removal of three gasoline USTs from the site. During the tank removal, soil samples were collected from the base of the tank excavation to assess potential hydrocarbon impact to soil beneath the former USTs.

In July 1992, RESNA installed four groundwater monitoring wells (MW-1 through MW-4) as part of an initial phase of subsurface environmental investigation. In January 1993, for a second phase of investigation, RESNA (1) installed on-site groundwater monitoring wells MW-5 and MW-6, (2) installed off-site monitoring well MW-7, (3) conducted aquifer pump tests, and (4) conducted a records search to identify potential off-site sources of hydrocarbons in soil and groundwater at the site. In April 1994, RESNA installed one groundwater monitoring compliance well (MW-8) on site, at the request of the ACHCSA.



Groundwater monitoring was initiated at the site in July 1992. For additional background information, please refer to *Report of Findings, Initial Offsite and Additional Onsite Subsurface Investigation and Aquifer Pumping Test* (RESNA, October 12, 1993).

Water levels are measured in wells MW-1 through MW-8 quarterly. Wells MW-1 and MW-4 are sampled annually during first quarter. Wells MW-2, MW-3, and MW-5 through MW-8 are sampled quarterly.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The first quarter 1995 groundwater monitoring event was performed by EMCON on March 15, 1995. Field work performed this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-8, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-8 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Copies of all field data sheets from the first quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during first quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (USEPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California Environmental Protection Agency (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank (LUFT) Field Manual* (State Water Resources Control Board, October 1989). Samples were analyzed for BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, November 1986, third edition). These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the first quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient

data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG and BTEX analyses. Copies of the first quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on March 15, 1995, illustrate that groundwater beneath the site flows northwest at an approximate hydraulic gradient of 0.01 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the first quarter of 1995.

Groundwater samples collected from wells MW-1 and MW-4 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from well MW-7 contained 150 micrograms per liter ($\mu\text{g/L}$) of non-fuel components eluting in the gasoline range (the chromatogram does not match the typical gasoline fingerprint). Groundwater samples collected from wells MW-2, MW-5, and MW-6 contained concentrations of TPHG from 170 to 3,600 $\mu\text{g/L}$ and concentrations of benzene from 5.6 to 77 $\mu\text{g/L}$. Groundwater samples collected from wells MW-3 and MW-8 contained 2,000 and 280 $\mu\text{g/L}$ TPHG, respectively, but did not contain detectable concentrations of benzene.

LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the scope, limitations, and cost of work performed during the monitoring event.

SITE STATUS UPDATE

This update reports site activities performed during the first quarter of 1995 and the anticipated site activities for the second quarter of 1995.

First Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring report for fourth quarter 1994.
- Performed quarterly groundwater monitoring for first quarter 1995. Based on eight consecutive quarters of nondetectable TPHG and BTEX results for wells MW-1 and MW-4, ARCO began sampling wells MW-1 and MW-4

annually (first quarter). Wells MW-2, MW-3, and MW-5 through MW-8 will be sampled quarterly. Water levels will be measured in all wells quarterly.

- Obtained off-site access to install wells MW-9 and MW-10.

Work Anticipated for Second Quarter 1995

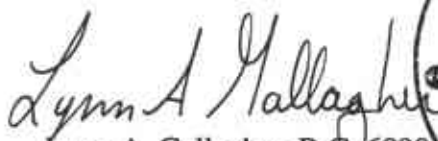
- Prepare and submit quarterly groundwater monitoring report for first quarter 1995.
- Perform quarterly groundwater monitoring for second quarter 1995.
- Install off-site wells MW-9 and MW-10.

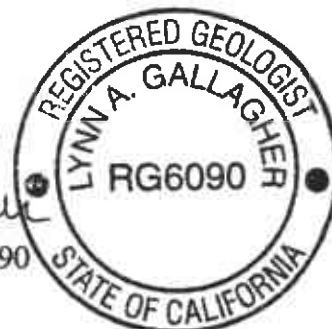
Please call if you have questions.

Sincerely,

EMCON


David Larsen
Project Coordinator


Lynn A. Gallagher, R.G. 6090
Project Geologist



Attachments: Table 1 - Groundwater Monitoring Data, First Quarter 1995
Table 2 - Historical Groundwater Elevation Data
Table 3 - Historical Groundwater Analytical Data (TPHG and BTEX)
Figure 1 - Site Location
Figure 2 - Groundwater Data, First Quarter 1995
Appendix A - Field Data Sheets, First Quarter 1995 Groundwater Monitoring Event
Appendix B - Analytical Results and Chain-of-Custody Documentation, First Quarter 1995

cc: Barney Chan, ACHCSA
Kevin Graves, RWQCB-SFBR

Table 1
Groundwater Monitoring Data
First Quarter 1995
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Floating Product Thickness feet	Ground- Water Flow Direction MWN	Hydraulic Gradient foot/foot	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl- benzene µg/l	Total Xylenes µg/l
MW-1	03-15-95	29.15	8.50	20.65	ND	NW	0.01	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-2	03-15-95	28.47	8.37	20.10	ND	NW	0.01	03-15-95	2100	7.4	<2.5	130	39
MW-3	03-15-95	28.57	8.47	20.10	ND	NW	0.01	03-15-95	2000	<2.5	<2.5	88	82
MW-4	03-15-95	29.21	8.69	20.52	ND	NW	0.01	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-5	03-15-95	28.12	8.47	19.65	ND	NW	0.01	03-15-95	170	5.6	<0.5	17	11
MW-6	03-15-95	27.79	7.75	20.04	ND	NW	0.01	03-15-95	3600	77	<5	420	180
MW-7	03-15-95	27.88	8.13	19.75	ND	NW	0.01	03-15-95	150*	<0.5	<0.5	<0.5	<0.5
MW-8	03-15-95	NR	8.43	NR	ND	NR	NR	03-15-95	280	<0.5	<0.5	0.7	0.7

TOC = Top of casing

ft-MSL = Elevation in feet, relative to mean sea level

MWN = Ground-water flow direction and gradient apply to the entire monitoring well network

TPHG = Total petroleum hydrocarbons as gasoline

µg/l = Micrograms per liter

ND = None detected

NW = Northwest

NR = Not reported; data is not available or not measurable

* = Chromatogram does not match the typical gasoline fingerprint.

Table 2
 Historical Groundwater Elevation Data
 Summary Report

ARCO Service Station 2185
 9800 East 14th Street, Oakland, California

Date: 05-04-95
 Project Number: 0805-130.03

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Floating Product Thickness feet	Ground- Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-1	07-24-92	29.15	13.38	15.77	ND	NR	NR
MW-1	08-26-92	29.15	13.92	15.23	ND	NR	NR
MW-1	09-22-92	29.15	14.18	14.97	ND	NR	NR
MW-1	10-19-92	29.15	14.52	14.63	ND	NR	NR
MW-1	11-23-92	29.15	14.54	14.61	ND	NR	NR
MW-1	12-16-92	29.15	12.20	16.95	ND	NR	NR
MW-1	01-14-93	29.15	9.32	19.83	ND	NR	NR
MW-1	02-26-93	29.15	9.38	19.77	ND	NR	NR
MW-1	03-26-93	29.15	10.04	19.11	ND	NR	NR
MW-1	04-09-93	29.15	10.50	18.65	ND	NR	NR
MW-1	05-19-93	29.15	11.26	17.89	ND	NR	NR
MW-1	06-17-93	29.15	11.53	17.62	ND	NR	NR
MW-1	07-28-93	29.15	12.00	17.15	ND	NR	NR
MW-1	08-23-93	29.15	12.31	16.84	ND	NR	NR
MW-1	09-28-93	29.15	12.60	16.55	ND	NR	NR
MW-1	10-11-93	29.15	12.74	16.41	ND	NR	NR
MW-1	11-16-93	29.15	12.96	16.19	ND	NR	NR
MW-1	12-16-93	29.15	11.68	17.47	ND	NR	NR
MW-1	02-08-94	29.15	11.29	17.86	ND	NR	NR
MW-1	03-04-94	29.15	10.61	18.54	ND	NR	NR
MW-1	05-10-94	29.15	11.12	18.03	ND	NR	NR
MW-1	08-12-94	29.15	12.55	16.60	ND	SW	0.004
MW-1	09-23-94	29.15	11.27	17.88	ND	NR	NR
MW-1	11-22-94	29.15	11.12	18.03	ND	SW	0.003
MW-1	03-15-95	29.15	8.50	20.65	ND	NW	0.01

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-2	07-24-92	28.47	12.95	15.52	ND	NR	NR
MW-2	08-26-92	28.47	13.55	14.92	ND	NR	NR
MW-2	09-22-92	28.47	13.78	14.69	ND	NR	NR
MW-2	10-19-92	28.47	14.09	14.38	ND	NR	NR
MW-2	11-23-92	28.47	14.06	14.41	ND	NR	NR
MW-2	12-16-92	28.47	11.70	16.77	ND	NR	NR
MW-2	01-14-93	28.47	8.87	19.60	ND	NR	NR
MW-2	02-26-93	28.47	8.98	19.49	ND	NR	NR
MW-2	03-26-93	28.47	9.57	18.90	ND	NR	NR
MW-2	04-09-93	28.47	10.02	18.45	ND	NR	NR
MW-2	05-19-93	28.47	10.81	17.66	ND	NR	NR
MW-2	06-17-93	28.47	11.08	17.39	ND	NR	NR
MW-2	07-28-93	28.47	11.60	16.87	ND	NR	NR
MW-2	08-23-93	28.47	11.90	16.57	ND	NR	NR
MW-2	09-28-93	28.47	12.17	16.30	ND	NR	NR
MW-2	10-11-93	28.47	12.31	16.16	ND	NR	NR
MW-2	11-16-93	28.47	12.54	15.93	ND	NR	NR
MW-2	12-16-93	28.47	11.29	17.18	ND	NR	NR
MW-2	02-08-94	28.47	10.85	17.62	ND	NR	NR
MW-2	03-04-94	28.47	10.16	18.31	ND	NR	NR
MW-2	05-10-94	28.47	10.70	17.77	ND	NR	NR
MW-2	08-12-94	28.47	12.12	16.35	ND	SW	0.004
MW-2	09-23-94	28.47	10.87	17.60	ND	NR	NR
MW-2	11-22-94	28.47	10.65	17.82	ND	SW	0.003
MW-2	03-15-95	28.47	8.37	20.10	ND	NW	0.01

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Floating Product Thickness feet	Ground- Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-3	07-24-92	28.57	12.90	15.67	Sheen	NR	NR
MW-3	08-26-92	28.57	13.51	15.06	ND	NR	NR
MW-3	09-22-92	28.57	13.73	14.84	ND	NR	NR
MW-3	10-19-92	28.57	14.04	14.53	ND	NR	NR
MW-3	11-23-92	28.57	14.02	14.55	ND	NR	NR
MW-3	12-16-92	28.57	11.73	16.84	ND	NR	NR
MW-3	01-14-93	28.57	9.17	19.40	ND	NR	NR
MW-3	02-26-93	28.57	9.30	19.27	ND	NR	NR
MW-3	03-26-93	28.57	9.83	18.74	ND	NR	NR
MW-3	04-09-93	28.57	10.22	18.35	ND	NR	NR
MW-3	05-19-93	28.57	10.91	17.66	ND	NR	NR
MW-3	06-17-93	28.57	10.74	17.83	ND	NR	NR
MW-3	07-28-93	28.57	11.60	16.97	ND	NR	NR
MW-3	08-23-93	28.57	11.93	16.64	ND	NR	NR
MW-3	09-28-93	28.57	12.13	16.44	ND	NR	NR
MW-3	10-11-93	28.57	12.26	16.31	ND	NR	NR
MW-3	11-16-93	28.57	12.48	16.09	ND	NR	NR
MW-3	12-16-93	28.57	11.26	17.31	ND	NR	NR
MW-3	02-08-94	28.57	10.93	17.64	ND	NR	NR
MW-3	03-04-94	28.57	10.33	18.24	ND	NR	NR
MW-3	05-10-94	28.57	10.77	17.80	ND	NR	NR
MW-3	08-12-94	28.57	12.07	16.50	ND	SW	0.004
MW-3	09-23-94	28.57	10.94	17.63	ND	NR	NR
MW-3	11-22-94	28.57	10.76	17.81	ND	SW	0.003
MW-3	03-15-95	28.57	8.47	20.10	ND	NW	0.01

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Floating Product Thickness feet	Ground- Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	07-24-92	29.21	13.68	15.53	ND	NR	NR
MW-4	08-26-92	29.21	14.12	15.09	ND	NR	NR
MW-4	09-22-92	29.21	14.46	14.75	ND	NR	NR
MW-4	10-19-92	29.21	14.74	14.47	ND	NR	NR
MW-4	11-23-92	29.21	14.75	14.46	ND	NR	NR
MW-4	12-16-92	29.21	12.45	16.76	ND	NR	NR
MW-4	01-14-93	29.21	9.46	19.75	ND	NR	NR
MW-4	02-26-93	29.21	9.54	19.67	ND	NR	NR
MW-4	03-26-93	29.21	10.19	19.02	ND	NR	NR
MW-4	04-09-93	29.21	10.67	18.54	ND	NR	NR
MW-4	05-19-93	29.21	11.52	17.69	ND	NR	NR
MW-4	06-17-93	29.21	11.79	17.42	ND	NR	NR
MW-4	07-28-93	29.21	12.30	16.91	ND	NR	NR
MW-4	08-23-93	29.21	12.60	16.61	ND	NR	NR
MW-4	09-28-93	29.21	12.88	16.33	ND	NR	NR
MW-4	10-11-93	29.21	13.03	16.18	ND	NR	NR
MW-4	11-16-93	29.21	13.24	15.97	ND	NR	NR
MW-4	12-16-93	29.21	11.96	17.25	ND	NR	NR
MW-4	02-08-94	29.21	11.54	17.67	ND	NR	NR
MW-4	03-04-94	29.21	10.84	18.37	ND	NR	NR
MW-4	05-10-94	29.21	11.38	17.83	ND	NR	NR
MW-4	08-12-94	29.21	12.82	16.39	ND	SW	0.004
MW-4	09-23-94	29.21	11.54	17.67	ND	NR	NR
MW-4	11-22-94	29.21	11.35	17.86	ND	SW	0.003
MW-4	03-15-95	29.21	8.69	20.52	ND	NW	0.01

Table 2
 Historical Groundwater Elevation Data
 Summary Report

ARCO Service Station 2185
 9800 East 14th Street, Oakland, California

Date: 05-04-95
 Project Number: 0805-130.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-5	02-26-93	28.12	9.00	19.12	ND	NR	NR
MW-5	03-26-93	28.12	9.41	18.71	ND	NR	NR
MW-5	04-09-93	28.12	9.80	18.32	ND	NR	NR
MW-5	05-19-93	28.12	10.50	17.62	ND	NR	NR
MW-5	06-17-93	28.12	10.73	17.39	ND	NR	NR
MW-5	07-28-93	28.12	11.15	16.97	ND	NR	NR
MW-5	08-23-93	28.12	11.43	16.69	ND	NR	NR
MW-5	09-28-93	28.12	11.66	16.46	ND	NR	NR
MW-5	10-11-93	28.12	11.80	16.32	ND	NR	NR
MW-5	11-16-93	28.12	12.00	16.12	ND	NR	NR
MW-5	12-16-93	28.12	10.81	17.31	ND	NR	NR
MW-5	02-08-94	28.12	10.53	17.59	ND	NR	NR
MW-5	03-04-94	28.12	9.89	18.23	ND	NR	NR
MW-5	05-10-94	28.12	10.37	17.75	ND	NR	NR
MW-5	08-12-94	28.12	11.60	16.52	ND	SW	0.004
MW-5	09-23-94	28.12	10.52	17.60	ND	NR	NR
MW-5	11-22-94	28.12	10.29	17.83	ND	SW	0.003
MW-5	03-15-95	28.12	8.47	19.65	ND	NW	0.01
MW-6	02-26-93	27.79	8.47	19.32	ND	NR	NR
MW-6	03-26-93	27.79	9.07	18.72	ND	NR	NR
MW-6	04-09-93	27.79	9.53	18.26	ND	NR	NR
MW-6	05-19-93	27.79	10.23	17.56	ND	NR	NR
MW-6	06-17-93	27.79	10.51	17.28	ND	NR	NR
MW-6	07-28-93	27.79	10.98	16.81	ND	NR	NR
MW-6	08-23-93	27.79	11.28	16.51	ND	NR	NR
MW-6	09-28-93	27.79	11.50	16.29	ND	NR	NR
MW-6	10-11-93	27.79	11.65	16.14	ND	NR	NR
MW-6	11-16-93	27.79	11.87	15.92	ND	NR	NR
MW-6	12-16-93	27.79	10.63	17.16	ND	NR	NR
MW-6	02-08-94	27.79	10.28	17.51	ND	NR	NR
MW-6	03-04-94	27.79	9.67	18.12	ND	NR	NR
MW-6	05-10-94	27.79	10.13	17.66	ND	NR	NR
MW-6	08-12-94	27.79	11.44	16.35	ND	SW	0.004
MW-6	09-23-94	27.79	10.27	17.52	ND	NR	NR
MW-6	11-22-94	27.79	10.10	17.69	ND	SW	0.003
MW-6	03-15-95	27.79	7.75	20.04	ND	NW	0.01

Table 2
 Historical Groundwater Elevation Data
 Summary Report

ARCO Service Station 2185
 9800 East 14th Street, Oakland, California

Date: 05-04-95
 Project Number: 0805-130.03

Well Desig- nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground- Water Elevation ft-MSL	Floating Product Thickness feet	Ground- Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-7	07-28-93	27.88	11.67	16.21	ND	NR	NR
MW-7	08-23-93	27.88	12.00	15.88	ND	NR	NR
MW-7	09-28-93	27.88	12.17	15.71	ND	NR	NR
MW-7	10-11-93	27.88	12.33	15.55	ND	NR	NR
MW-7	11-16-93	27.88	12.46	15.42	ND	NR	NR
MW-7	12-16-93	27.88	11.23	16.65	ND	NR	NR
MW-7	02-08-94	27.88	10.83	17.05	ND	NR	NR
MW-7	03-04-94	27.88	10.13	17.75	ND	NR	NR
MW-7	05-10-94	27.88	10.68	17.20	ND	NR	NR
MW-7	08-12-94	27.88	12.05	15.83	ND	SW	0.004
MW-7	09-23-94	27.88	10.85	17.03	ND	NR	NR
MW-7	11-22-94	27.88	10.60	17.28	ND	SW	0.003
MW-7	03-15-95	27.88	8.13	19.75	ND	NW	0.01
MW-8	08-12-94	NR	11.43	NR	ND	NR	NR
MW-8	09-23-94	NR	10.99	NR	ND	NR	NR
MW-8	11-22-94	NR	10.42	NR	ND	NR	NR
MW-8	03-15-95	NR	8.43	NR	ND	NR	NR

TOC = Top of casing
 ft-MSL = Elevation in feet, relative to mean sea level
 MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
 ND = None detected
 NR = Not reported; data not available or not measurable
 SW = Southwest
 NW = Northwest

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl- benzene µg/l	Total Xylenes µg/l
MW-1	07-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	10-19-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	01-14-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	04-09-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	08-23-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	10-11-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	03-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	05-10-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	08-12-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	11-22-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-2	07-24-92	5900	510	<10	370	430
MW-2	10-19-92	4100	110	<10	100	62
MW-2	01-14-93	12000	700	10	720	680
MW-2	04-09-93	8400	220	<10	480	320
MW-2	08-23-93	3700	89	<5	230	150
MW-2	10-11-93	2700	50	<2.5	<140	68
MW-2	03-04-94	3100	49	<2.5	180	98
MW-2	05-10-94	3100	39	<2.5	220	99
MW-2	08-12-94	1800	13	<2.5	120	35
MW-2	11-22-94	2300	45	<0.5	190	93
MW-2	03-15-95	2100	7.4	<2.5	130	39
MW-3	07-24-92	Not sampled: well contained floating product				
MW-3	10-19-92	42000	740	1100	1500	5700
MW-3	01-14-93	44000	1100	840	2200	9600
MW-3	04-09-93	21000	33	69	350	1600
MW-3	08-23-93	13000	63	21	530	1300
MW-3	10-11-93	11000	56	13	530	1200
MW-3	03-04-94	17000	50	<10	790	1600
MW-3	05-10-94	14000	32	<10	710	1200
MW-3	08-12-94	13000	37	<10	640	970
MW-3	11-22-94	15000	150	<10	1300	2000
MW-3	03-15-95	2000	<2.5	<2.5	88	82

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 2185
9800 East 14th Street, Oakland, California

Date: 05-04-95
Project Number: 0805-130.03

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl- benzene µg/l	Total Xylenes µg/l
MW-4	07-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-4	10-19-92	<50	<0.5	<0.5	<0.5	<0.5
MW-4	01-14-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	04-09-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	08-23-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	10-11-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	03-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	05-10-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	08-12-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	11-22-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-5	02-11-93	9300	620	<50	890	2200
MW-5	04-09-93	960	29	<1	100	96
MW-5	08-23-93	2700	50	<2.5	260	250
MW-5	10-11-93	840	9	<1	87	41
MW-5	03-04-94	540	0.9	0.6	16	6.3
MW-5	05-10-94	1300	11	<2.5	110	68
MW-5	08-12-94	1500	10	<2.5	110	30
MW-5	11-22-94	84	1	<0.5	5	2
MW-5	03-15-95	170	5.6	<0.5	17	11
MW-6	02-11-93	4800	630	<10	490	460
MW-6	04-09-93	13000	880	<10	1000	1000
MW-6	08-23-93	6300	390	<20	450	390
MW-6	10-11-93	2900	150	3.4	190	140
MW-6	03-04-94	5800	320	<5	510	360
MW-6	05-10-94	11000	470	<10	880	650
MW-6	08-12-94	4400	170	<10	390	210
MW-6	11-22-94	7300	390	<5	940	640
MW-6	03-15-95	3600	77	<5	420	180

Table 3
 Historical Groundwater Analytical Data
 Summary Report

ARCO Service Station 2185
 9800 East 14th Street, Oakland, California

Date: 05-04-95
 Project Number: 0805-130.03

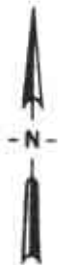
Well Desig- nation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl- benzene µg/l	Total Xylenes µg/l
MW-7	05-14-93	350	0.83	<0.5	<0.5	<0.5
MW-7	08-23-93	630*	7.3	<1	<1	<1
MW-7	10-11-93	620*	3.5	<0.5	<0.5	<0.5
MW-7	03-04-94	320*	<0.5	<0.5	<0.5	<0.5
MW-7	05-10-94	330*	0.6	<0.5	<0.5	<0.5
MW-7	08-12-94	360*	<0.5	<0.5	<0.5	<0.5
MW-7	11-22-94	<50	<0.5	<0.5	<0.5	<0.5
MW-7	03-15-95	150*	<0.5	<0.5	<0.5	<0.5
MW-8	08-12-94	5100	12	<5	470	53
MW-8	11-22-94	2300	16	<0.5	140	4
MW-8	03-15-95	280	<0.5	<0.5	0.7	0.7

TPHG = Total petroleum hydrocarbons as gasoline
 µg/l = Micrograms per liter
 * = Chromatogram does not match the typical gasoline fingerprint.



Base map from USGS 7.5' Quad. Maps:
Oakland East and San Leandro, California.
Photorevised 1980.

Scale : 0 2000 4000 Feet



EMCON
Associates

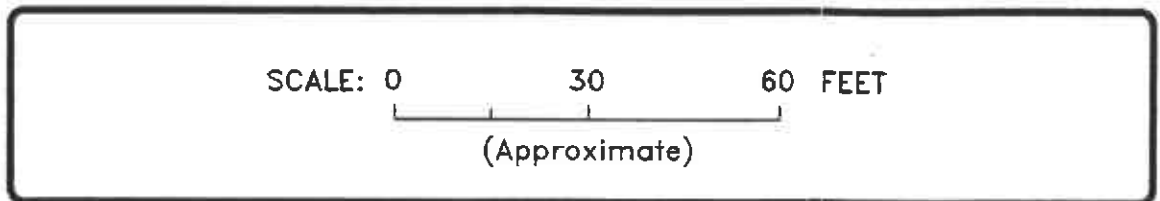
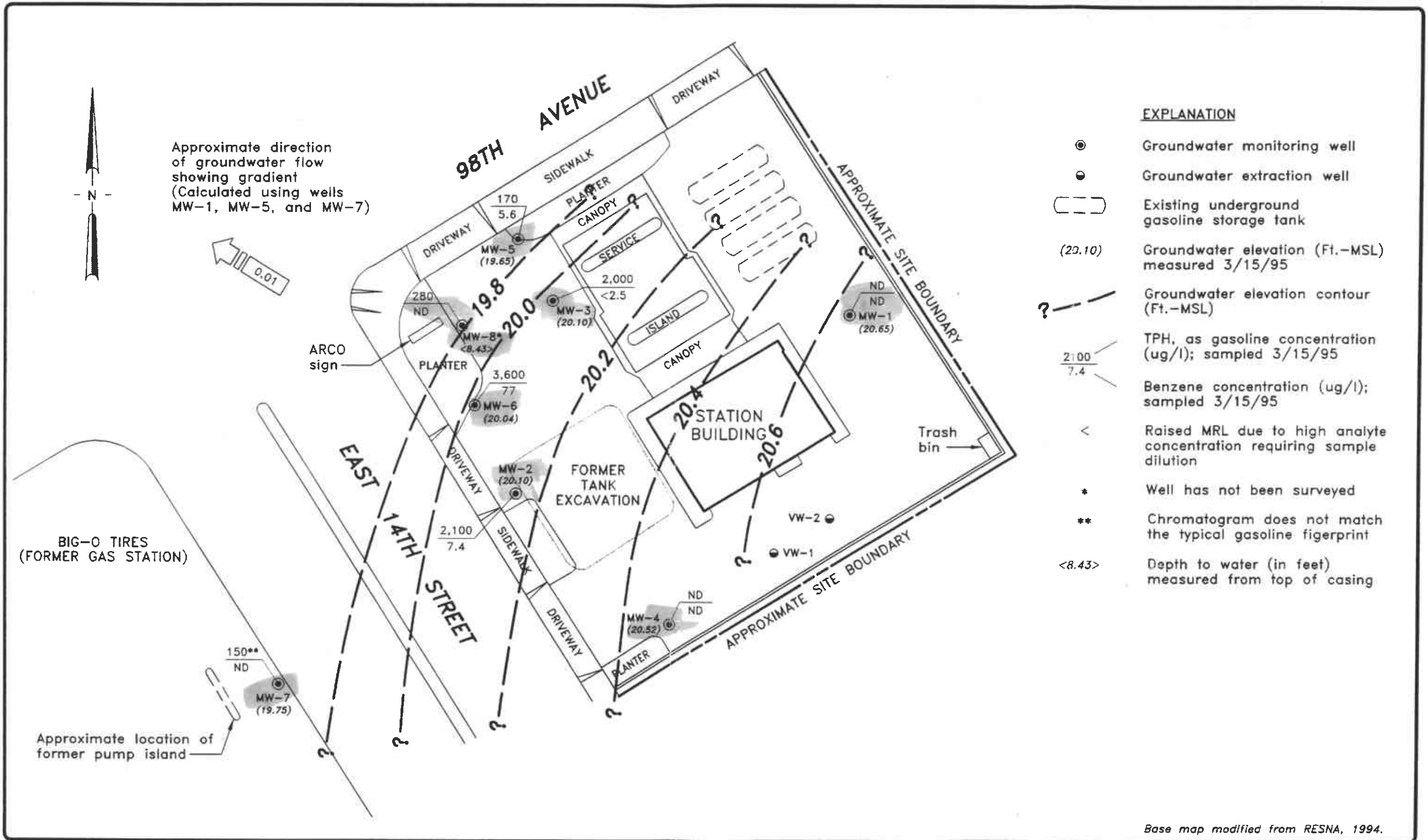
ARCO PRODUCTS COMPANY
SERVICE STATION 2185, 9800 E. 14TH STREET
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

SITE LOCATION

FIGURE

1

PROJECT NO.
805-130.01



ARCO PRODUCTS COMPANY
 SERVICE STATION 2185, 9800 E. 14TH STREET
 QUARTERLY GROUNDWATER MONITORING
 OAKLAND, CALIFORNIA

GROUNDWATER DATA
 FIRST QUARTER 1995

FIGURE NO.
2
 PROJECT NO.
 805-130.03

APPENDIX A

**FIELD DATA SHEETS, FIRST QUARTER 1995 GROUNDWATER
MONITORING EVENT**

**FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : 1775-236.01

STATION ADDRESS : 9800 East 14th Street

DATE : 3/15/25

ARCO STATION # : 2185

FIELD TECHNICIAN : D Gambelin

DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	Yes	Yes	NA	2KA	Yes	8.50	8.50	NO	NO	23.5	
2	MW-4	↓	↓	↓	2KA	↓	8.69	8.69	↓	↓	23.7	
3	MW-7	↓	↓	↓	None	↓	8.13	8.13	↓	↓	25.2	
4	MW-5	↓	↓	↓	2KA	↓	8.47	8.47	↓	↓	26.6	
5	MW-8	↓	↓	↓	2KA	↓	8.43	8.43	↓	↓	22.3	
6	MW-2	↓	↓	↓	2KA	↓	8.37	8.37	↓	↓	23.5	
7	MW-6	↓	↓	↓	2KA	↓	7.75	7.75	↓	↓	27.5	
8	MW-3	↓	↓	↓	2KA	↓	8.47	8.47	↓	↓	23.2	Water in Box above TOC

SURVEY POINTS ARE TOP OF WELL CASINGS



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236.01

SAMPLE ID: MW 1

PURGED BY: D. Gambelin

CLIENT NAME: ARCO 2195

SAMPLED BY: D. Gambelin

LOCATION: Oakland, CA

TYPE: Ground Water Surface Water Treatment Effluent Other

CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.8

DEPTH TO WATER (feet): 8.50 CALCULATED PURGE (gal.): 29.4

DEPTH OF WELL (feet): 23.5 ACTUAL PURGE VOL (gal.): 30.0

DATE PURGED: 3/15/95 Start (2400 Hr) 1411 End (2400 Hr) 1414

DATE SAMPLED: 3/15/95 Start (2400 Hr) 1420 End (2400 Hr) 1421

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1412</u>	<u>10.0</u>	<u>6.56</u>	<u>631</u>	<u>62.8</u>	<u>Tan</u>	<u>Mod.</u>
<u>1413</u>	<u>20.0</u>	<u>6.53</u>	<u>621</u>	<u>66.5</u>	<u>Tan</u>	<u>Mod.</u>
<u>1414</u>	<u>30.0</u>	<u>6.54</u>	<u>618</u>	<u>66.3</u>	<u>Tan</u>	<u>Mod.</u>

D. O. (ppm): NR ODOR: None COLOR: NR TURBIDITY: NR

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Well Wizard™
- Bailor (Teflon)
- Bailor (PVC)
- Bailor (Stainless Steel)
- Dedicated

Other: _____

SAMPLING EQUIPMENT

- 2" Bladder Pump
- Bailor (Teflon)
- Bailor (Stainless Steel)
- Submersible Pump
- Dedicated
- DDL Sampler
- Dipper
- Well Wizard™

Other: _____

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: 68.0

(EC 1000 1039 / 1000) (DI —) (pH 7 7.15 / 7.00) (pH 10 9.98 / 10.00) (pH 3.88 / —)

Location of previous calibration: _____

Signature: D. Gambelin

Reviewed By: JG

Page 1 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236.01

SAMPLE ID: MW-2

PURGED BY: D. Gambelin

CLIENT NAME: ARCO 2185

SAMPLED BY: D. Gambelin

LOCATION: Oakland, CA

TYPE: Ground Water Surface Water _____ Treatment Effluent _____ Other _____

CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>9.88</u>
DEPTH TO WATER (feet): <u>8.37</u>	CALCULATED PURGE (gal.): <u>29.65</u>
DEPTH OF WELL (feet): <u>23.5</u>	ACTUAL PURGE VOL. (gal.): <u>30.0</u>

DATE PURGED: <u>3/15/95</u>	Start (2400 Hr) <u>1621</u>	End (2400 Hr) <u>1625</u>
DATE SAMPLED: <u>3/15/95</u>	Start (2400 Hr) <u>1628</u>	End (2400 Hr) <u>1629</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1623</u>	<u>10.0</u>	<u>6.47</u>	<u>713</u>	<u>67.0</u>	<u>Grey</u>	<u>Light</u>
<u>1624</u>	<u>20.0</u>	<u>6.46</u>	<u>716</u>	<u>67.6</u>	<u>↓</u>	<u>Heavy</u>
<u>1625</u>	<u>30.0</u>	<u>6.49</u>	<u>724</u>	<u>67.4</u>	<u>↓</u>	<u>Heavy</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: Heavy NR NR

Field QC samples collected at this well: NR Parameters field filtered at this well: NR

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|------------------------------------------------------|---------------------------------------------------|------------------------------------------|-------------------------------------------------------|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailor (Teflon's) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailor (Teflon's) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailor (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailor (Stainless Steel) |
| <input checked="" type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailor (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |

Other: _____

Other: _____

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: _____

(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-1

Signature: D. Gambelin

Reviewed By: gjb

Page 7 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236.01

SAMPLE ID: MW-3

PURGED BY: D. Gambelin

CLIENT NAME: ARCO 2185

SAMPLED BY: D. Gambelin

LOCATION: Oakland, CA

TYPE: Ground Water Surface Water Treatment Effluent Other

CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.62

DEPTH TO WATER (feet): 8.47 CALCULATED PURGE (gal.): 29.87

DEPTH OF WELL (feet): 23.2 ACTUAL PURGE VOL (gal.): 29.0

DATE PURGED: 3/15/95

Start (2400 Hr) 1650

End (2400 Hr) 1653

DATE SAMPLED: 3/15/95

Start (2400 Hr) 1655

End (2400 Hr) 1656

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (Visual)	TURBIDITY (visual)
<u>1651</u>	<u>10.0</u>	<u>6.71</u>	<u>520</u>	<u>66.0</u>	<u>Grey</u>	<u>Moderate</u>
<u>1652</u>	<u>20.0</u>	<u>6.64</u>	<u>558</u>	<u>66.4</u>	<u>↓</u>	<u>Light</u>
<u>1653</u>	<u>29.0</u>	<u>6.63</u>	<u>561</u>	<u>66.4</u>	<u>↓</u>	<u>↓</u>

D. O. (ppm): NR

ODOR: None

NR

NR

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

(COBALT 0 - 500)

(NTU 0 - 200 or 0 - 1000)

PURGING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Well Wizard™
- Bailor (Teflon)
- Bailor (PVC)
- Bailor (Stainless Steel)
- Dedicated

Other: _____

SAMPLING EQUIPMENT

- 2" Bladder Pump
- DDL Sampler
- Dipper
- Well Wizard™
- Bailor (Teflon)
- Bailor (Stainless Steel)
- Submersible Pump
- Dedicated

Other: _____

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: _____

(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-1

Signature: Tom Bels

Reviewed By: JB

Page 3 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236.01

SAMPLE ID: MW-4

PURGED BY: D. Gambelin

CLIENT NAME: ARCO 218.5

SAMPLED BY: D. Gambelin

LOCATION: Oakland CA

TYPE: Ground Water Surface Water _____ Treatment Effluent _____ Other _____

CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.91

DEPTH TO WATER (feet): 8.69 CALCULATED PURGE (gal.): 29.42

DEPTH OF WELL (feet): 23.7 ACTUAL PURGE VOL. (gal.): 30.0

DATE PURGED: 3/15/95

Start (2400 Hr) 1431

End (2400 Hr) 1437

DATE SAMPLED: 3/15/95

Start (2400 Hr) 1440

End (2400 Hr) 1441

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1434</u>	<u>10.0</u>	<u>6.49</u>	<u>566</u>	<u>67.4</u>	<u>Tan</u>	<u>Light</u>
<u>1435</u>	<u>20.0</u>	<u>6.47</u>	<u>561</u>	<u>66.7</u>	<u>Tan</u>	<u>Light</u>
<u>1437</u>	<u>30.0</u>	<u>6.48</u>	<u>554</u>	<u>66.3</u>	<u>Tan</u>	<u>Light</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR

ODOR: None

NR NR

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Well Wizard™
- Bailer (Teflon &)
- Bailer (PVC)
- Bailer (Stainless Steel)
- Dedicated

Other: _____

SAMPLING EQUIPMENT

- 2" Bladder Pump
- DDL Sampler
- Dipper
- Well Wizard™
- Bailer (Teflon &)
- Bailer (Stainless Steel)
- Submersible Pump
- Dedicated

Other: _____

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9016 Temperature °F: _____

(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-1

Signature: Dai Loh

Reviewed By: [Signature]

Page 4 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236.01
PURGED BY: D. Gombel
SAMPLED BY: D. Gombel

SAMPLE ID: MW-5
CLIENT NAME: ARCO2185
LOCATION: Oakland CA

TYPE: Ground Water Surface Water _____ Treatment Effluent _____ Other _____

CASING DIAMETER (inches): 2 _____ 3 _____ 4 4.5 _____ 6 _____ Other _____

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>11.84</u>
DEPTH TO WATER (feet): <u>8.47</u>	CALCULATED PURGE (gal.): <u>35.53</u>
DEPTH OF WELL (feet): <u>26.6</u>	ACTUAL PURGE VOL. (gal.): <u>36.0</u>

DATE PURGED: <u>3/15/95</u>	Start (2400 Hr) <u>1553</u>	End (2400 Hr) <u>1600</u>
DATE SAMPLED: <u>3/15/95</u>	Start (2400 Hr) <u>1603</u>	End (2400 Hr) <u>1604</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1555</u>	<u>12.0</u>	<u>6.70</u>	<u>503</u>	<u>66.5</u>	<u>Grey</u>	<u>Moderate</u>
<u>1557</u>	<u>24.0</u>	<u>6.72</u>	<u>509</u>	<u>67.4</u>	<u>Grey</u>	<u>Moderate</u>
<u>1600</u>	<u>36.0</u>	<u>6.71</u>	<u>501</u>	<u>67.9</u>	<u>Grey</u>	<u>Moderate</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: Slight _____ _____
 (COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input checked="" type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon)
<input checked="" type="checkbox"/> Centrifugal Pump	<input type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)
Location of previous calibration: MW-1

Signature: D. Gombel Reviewed By: JB Page 5 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 3, 2/94

PROJECT NO: 1775-236 01

SAMPLE ID: MW-6

PURGED BY: C. Gambelin

CLIENT NAME: ARCO 2185

SAMPLED BY: D. Ganselton

LOCATION: Oakland, CA

TYPE: Ground Water Surface Water Treatment Effluent Other

CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>12.90</u>
DEPTH TO WATER (feet): <u>7.75</u>	CALCULATED PURGE (gal.): <u>38.71</u>
DEPTH OF WELL (feet): <u>27.5</u>	ACTUAL PURGE VOL (gal.): <u>39.0</u>

DATE PURGED: <u>3/15/95</u>	Start (2400 Hr) <u>1633</u>	End (2400 Hr) <u>1638</u>
DATE SAMPLED: <u>3/15/95</u>	Start (2400 Hr) <u>1640</u>	End (2400 Hr) <u>1641</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1634</u>	<u>13.0</u>	<u>6.49</u>	<u>761</u>	<u>67.3</u>	<u>Clear</u>	<u>Light</u>
<u>1636</u>	<u>26.0</u>	<u>6.56</u>	<u>760</u>	<u>67.9</u>	<u>Clear</u>	<u>Light</u>
<u>1638</u>	<u>39.0</u>	<u>6.56</u>	<u>752</u>	<u>67.9</u>	<u>Clear</u>	<u>Light</u>

D. O. (ppm): NR ODOR: Heavy NR NR
 (COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR Parameters field filtered at this well: NR

PURGING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Well Wizard™
- Other: _____

SAMPLING EQUIPMENT

- 2" Bladder Pump
- Bailer (Teflon®)
- Bailer (PVC)
- Bailer (Stainless Steel)
- DDL Sampler
- Dipper
- Well Wizard™
- Bailer (Stainless Steel)
- Submersible Pump
- Dedicated
- Other: _____

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: _____
 (EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)
 Location of previous calibration: MW-1

Signature: [Signature] Reviewed By: [Signature] Page 6 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

PROJECT NO: 1775-236.01
PURGED BY: D. Gambelin
SAMPLED BY: D. Gambelin

SAMPLE ID: MW-7
CLIENT NAME: ARCO 2185
LOCATION: Dakland, CA

TYPE: Ground Water Surface Water Treatment Effluent Other
CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.79
DEPTH TO WATER (feet): 9.13 CALCULATED PURGE (gal.): 8.36
DEPTH OF WELL (feet): 25.2 ACTUAL PURGE VOL (gal.): 8.5

DATE PURGED: 3/15/95 Start (2400 Hr) 1504 End (2400 Hr) 1511
DATE SAMPLED: 3/15/95 Start (2400 Hr) 1514 End (2400 Hr) 1515

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1507</u>	<u>3.0</u>	<u>6.45</u>	<u>708</u>	<u>66.6</u>	<u>Tan</u>	<u>Heavy</u>
<u>1509</u>	<u>6.0</u>	<u>6.50</u>	<u>710</u>	<u>66.1</u>	<u>Tan</u>	<u>Heavy</u>
<u>1511</u>	<u>8.5</u>	<u>6.53</u>	<u>701</u>	<u>65.5</u>	<u>Tan</u>	<u>Heavy</u>

D. O. (ppm): NR ODOR: None COLOR: NR TURBIDITY: NR
(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR Parameters field filtered at this well: NR

PURGING EQUIPMENT

- 2" Bladder Pump
- Centrifugal Pump
- Submersible Pump
- Well Wizard™
- Bailor (Teflon)
- Bailor (PVC)
- Bailor (Stainless Steel)
- Dedicated

SAMPLING EQUIPMENT

- 2" Bladder Pump
- ODL Sampler
- Dipper
- Well Wizard™
- Bailor (Teflon)
- Bailor (Stainless Steel)
- Submersible Pump
- Dedicated

Other: _____

Other: _____

WELL INTEGRITY: Good / LWC broken, replaced LOCK #: None

REMARKS: Replaced w/ Musto lock 3490

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9010 Temperature °F: _____

(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-1

Signature: Don Bell Reviewed By: [Signature] Page 7 of 8



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

PROJECT NO: 1775 236.01

SAMPLE ID: MW-8

PURGED BY: D. Gambelin

CLIENT NAME: ARLD 2185

SAMPLED BY: D. Gambelin

LOCATION: Oakland, CA

TYPE: Ground Water Surface Water Treatment Effluent Other

CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>11.84</u>
DEPTH TO WATER (feet): <u>8.43</u>	CALCULATED PURGE (gal.): <u>35.53</u>
DEPTH OF WELL (feet): <u>22.3</u>	ACTUAL PURGE VOL. (gal.): <u>36.0</u>

DATE PURGED: <u>3/15/95</u>	Start (2400 Hr) <u>1534</u>	End (2400 Hr) <u>1539</u>
DATE SAMPLED: <u>3/15/95</u>	Start (2400 Hr) <u>1542</u>	End (2400 Hr) <u>1543</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1535</u>	<u>12.0</u>	<u>6.48</u>	<u>569</u>	<u>67.3</u>	<u>Grey</u>	<u>Heavy</u>
<u>1537</u>	<u>24.0</u>	<u>6.44</u>	<u>592</u>	<u>67.4</u>	<u>↓</u>	<u>Moderate</u>
<u>1539</u>	<u>36.0</u>	<u>6.48</u>	<u>585</u>	<u>67.4</u>	<u>↓</u>	<u>Moderate</u>

D. O. (ppm): NR ODOR: Moderate COLOR: NR TURBIDITY: NR

Field QC samples collected at this well: NR Parameters field filtered at this well: NR

- | PURGING EQUIPMENT | | SAMPLING EQUIPMENT | |
|------------------------------------------------------|---------------------------------------------------|------------------------------------------|-------------------------------------------------------|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailor (Teflon's) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailor (Teflon's) |
| <input checked="" type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailor (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailor (Stainless Steel) |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailor (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
| Other: _____ | | Other: _____ | |

WELL INTEGRITY: Good LOCK #: 2KA

REMARKS: _____

Meter Calibration: Date: 3/15/95 Time: 1355 Meter Serial #: 9610 Temperature °F: _____
 (EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-1

Signature: D. Gambelin Reviewed By: JB Page 9 of 9

APPENDIX B

**ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION,
FIRST QUARTER 1995**

**Columbia
Analytical
Services^{inc.}**

March 29, 1995

Service Request No. S950328

John Young
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 2185 / Emcon Project No. 1775-236.01**

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on March 16, 1995. For your reference, these analyses have been assigned our service request number S950328.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

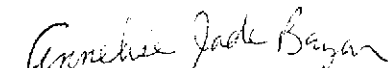
Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.



Steven L. Green
Project Chemist



Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

001

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL, but greater than or equal to the MDL

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

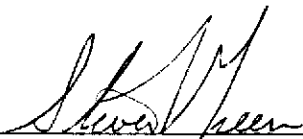
Client:	EMCON	Service Request:	S950328
Project:	ARCO Facility No. 2185 / EMCON Project No. 1775-236.01	Date Collected:	3/15/95
Sample Matrix:	Water	Date Received:	3/16/95
		Date Extracted:	NA
		Date Analyzed:	3/24,27/95

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

	Analyte:	TPH as			Ethyl-	Xylenes,
	Units:	Gasoline	Benzene	Toluene	benzene	Total
	Method Reporting Limit:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
		50	0.5	0.5	0.5	0.5

Sample Name	Lab Code					
MW-1 (23)	S950328-001	ND	ND	ND	ND	ND
MW-2 (23)	S950328-002	2,100	7.4	<2.5 *	130	39
MW-3 (23)	S950328-003	2,000	<2.5 *	<2.5 *	88	82
MW-4 (23)	S950328-004	ND	ND	ND	ND	ND
MW-5 (26)	S950328-005	170	5.6	ND	17	11
MW-6 (27)	S950328-006	3,600	77	<5 *	420	180
MW-7 (25)	S950328-007	150**	ND	ND	ND	ND
MW-8 (22)	S950328-008	280	ND	ND	0.7	0.7
Method Blank	S950324-WB	ND	ND	ND	ND	ND
Method Blank	S950327-WB	ND	ND	ND	ND	ND

* Raised MRL due to high analyte concentration requiring sample dilution.
 ** Sample contains non-fuel components eluting in the gasoline range, quantified as gasoline. The chromatogram does not match the typical gasoline fingerprint.

Approved By:  Date: 3/30/95

SABTXGAS/061694

003

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 2185 / EMCON Project No. 1775-236.01
Sample Matrix: Water

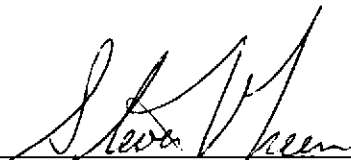
Service Request: S950328
Date Collected: 3/15/95
Date Received: 3/16/95
Date Extracted: NA
Date Analyzed: 3/24,27/95

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery
		α,α,α -Trifluorotoluene
MW-1 (23)	S950328-001	94
MW-2 (23)	S950328-002	113
MW-3 (23)	S950328-003	102
MW-4 (23)	S950328-004	92
MW-5 (26)	S950328-005	95
MW-6 (27)	S950328-006	98
MW-7 (25)	S950328-007	94
MW-8 (22)	S950328-008	110
MW-1 (23) MS	S950328-001MS	105
MW-1 (23) DMS	S950328-001DMS	103
Method Blank	S950324-WB	89
Method Blank	S950327-WB	94

CAS Acceptance Limits: 69-116

Approved By: _____



Date: _____

3/30/95

SUR1/062994

005

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

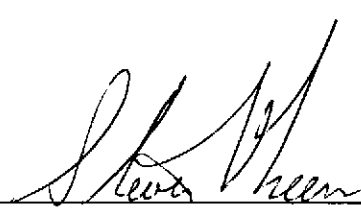
Client: EMCON
Project: ARCO Facility No. 2185 / EMCON Project No. 1775-236.01

Service Request: S950328
Date Analyzed: 3/24/95

Initial Calibration Verification (ICV) Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	26.5	106	85-115
Toluene	25	25.6	102	85-115
Ethylbenzene	25	25.8	103	85-115
Xylenes, Total	75	76.1	101	85-115
Gasoline	250	242	97	90-110

Approved By: _____



Date: _____

3/30/95

ICV25AL/060194

006

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 2185 / EMCON Project No. 1775-236.01
Sample Matrix: Water

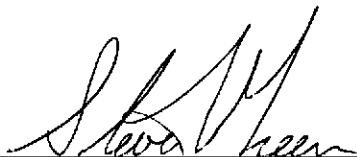
Service Request: S950328
Date Collected: 3/15/95
Date Received: 3/16/95
Date Extracted: NA
Date Analyzed: 3/24/95

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: MW-1 (23)
Lab Code: S950328-001

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS		
Gasoline	250	250	ND	224	230	90	92	67-121	3

Approved By: _____



Date: _____

3/22/95

007

DMSIS/060194

ARCO Facility no. 2185	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 453-7300	Contract number
Consultant name EMCON		Address (Consultant) 1971 Ringwood Avenue	

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA 8020/8020/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAMP Metals EPA 6010/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org./DHS <input type="checkbox"/> Lead EPA 7420/7421 <input type="checkbox"/>	
			Soil	Water	Other	Ice	Acid															
MW1(23)	1	2		X		X	HCl	3/15	1655	X												
MW2(23)	2	↓		↓		↓			1628	X												
MW3(23)	3	2		↓		↓			1655	X												
MW4(23)	4	↓		↓		↓			1440	X												
MW5(26)	5	↓		↓		↓			1603	X												
MW6(27)	6	↓		↓		↓			1640	X												
MW7(25)	7	↓		↓		↓			1514	X												
MW8(22)	8	↓		↓		↓			1542	X												

Method of shipment
Sampler will deliver

Special detection Limit/reporting
Lowest Possible

Special QA/QC
As Normal

Remarks

1775-236.01

Lab number
5950328

Turnaround time

Priority Rush 1 Business Day

Rush 2 Business Days

Expedited 5 Business Days

Standard 10 Business Days

Condition of sample:		Temperature received:	
Relinquished by sampler <i>[Signature]</i>	Date Time 3-16-95 10:10	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory <i>[Signature]</i>	Date Time 3-16-95 10:12

bnu